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Remarks

Applicants respectfully request reconsideration.

Claims 1, 4, 5, 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,263,086 to Wang ("Wang") in view of U.S. Patent No. 6,275,599 to Adler et al. ("Adler") in view of U.S. Patent No. 6,252,971 to Wang ("Wang 971").

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, Adler, Wang '971, and U.S. Patent No. 5,930,369 to Cox ("Cox").

Claims 3, 7, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, Adler, Wang '971 and US Patent Publication No. 2002/0169962 ("Brundage"). Note that there appears to be a typographical error in the Office action, and the reference to "2002/016992" has been interpreted as 2002/0169962.

Claims 9, 12, 14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, Adler, Wang '971 and US Patent No. 6,591,365 to Cookson ("Cookson").

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, Adler, Cookson and U.S. Patent No. 4,552,617 to Crane ("Crane").

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, Adler, Cookson, Wang '971 and Brundage.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, Adler, Wang '971 and U.S. Patent No. 6,539,095 to Rhoads ("Rhoads").

In response to applicants' arguments, the Office has made new grounds for rejection that differ from the previous rejection in the following two respects:

1. Wang '971 has been added as an additional reference, cited in further combination with the references relied upon in Section 103 rejections of the claims; and
2. Claim 17 is now rejected based on a combination of Wang, Adler, Wang '971 and Rhoads, instead of a combination of Wang, Adler and Cookson.

Applicants respectfully traverse these rejections because Wang '971 does not redress the deficiencies of the other references cited in the last action. The claims are patentable over the cited references for the reasons provided in response to the last action, as further elaborated below.

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Claims 1, 4, 5, 6 and 8 are patentable over Adler, Wang, and Wang '971

Claim 1

In the new ground of rejection, the Office relies on Wang '971, and specifically, col. 1, line 57 to col. 2, line 10. In this passage, Wang '971 refers to the difficulty of retrieving an invisible watermark from a printed copy because of the distortion introduced by printing and scanning. However, this reference teaches away from the invention of claim 1 because it is trying to make the invisible watermark less susceptible to this distortion, rather than using a screen structure that causes ink flow errors that are detectable by reading an auxiliary embedded signal as claimed. None of the references, either considered alone or in combination teach using an inherently unstable screen structure as claimed.

Claims 4 and 5 are patentable for the same reasons as claim 1.

Claim 6

The Office contends that "it is inherent that the strength of the watermark is being measured." Applicants respectfully disagree. It is not inherent in Wang, Adler or Wang '971. Block 805 of Adler shows a verification step that determines whether a hash of frequency coefficients in a compressed digital image is equal to a cryptographic function of the extracted watermark (e.g., 512 bits) from that image. In other words, a function of the watermark bits is being compared with a hash of frequency coefficients in the image. Adler performs this analysis to determine whether a watermarked, compressed digital image has been modified in even the slightest way. If Adler were to create a printed object from this watermarked, compressed digital image, the value of the hash would certainly change as would the watermark bits. The process of creating a printed object would, therefore, cause the verification process to fail before any reproduction were made of the printed object. As such, Adler's method cannot be used to detect reproduction errors due to inaccurate reproduction of the printed object as claimed because both the printed object and reproductions of it would fail the verification step of block 805 (i.e. both the original printed object and the reproduction of it, if scanned and then tested per block 805 would give the same result: image is not authentic).

The following claim language is not inherent in Adler nor taught in any of the references, whether considered alone or in combination: "using a measurement of strength of the digital

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watermark to detect reproduction errors due to inaccurate reproduction of unstable halftone screen structures in the printed object". The combined teachings fail to teach all of the elements of claim 6. As noted, the cited passage of Wang '971 is directed to making the watermark retrievable despite distortion. Wang '971 does not teach: "using a measurement of strength of the digital watermark to detect reproduction errors due to inaccurate reproduction of unstable halftone screen structures in the printed object" and in fact, teaches away from it.

Claim 8 is patentable over Wang, Adler and Wang '971 for the same reasons as claim 6.

Claim 2 is patentable over the combination of Wang, Adler, Wang '971 and Cox

Cox fails to teach the elements of claim 1 that are missing from Wang, Adler and Wang '971. Therefore, the combination of Wang, Adler and Cox fails to teach all of the elements of claim 2.

Claims 3, 7, 10, and 11 are patentable over the combination of Wang, Adler and Brundage

Brundage fails to teach the elements of claim 1 that are missing from Wang, Adler and Wang '971. Therefore, the combination of Wang, Adler, Wang '971 and Brundage fails to teach all of the elements of claim 3. Similarly, Brundage fails to teach the elements of claim 6 that are missing from Wang, Adler, and Wang '971. Therefore, the combination of Wang, Adler and Brundage fails to teach all of the elements of claims 7, 10 and 11.

Even assuming that Brundage refers to the capability of a payload to represent different data, it does not teach, for example, the use of the halftone screen type as set forth in claim 10.

Claims 9, 12, 14, and 16 are patentable over the combination of Wang, Adler, Wang '971 and Cookson

Claim 9

Cookson fails to teach the elements of claim 6 that are missing from Wang, Wang '971 and Adler. Therefore, the combination of Wang, Wang '971, Adler and Cookson fails to teach all of the elements of claims 9.

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Claim 12

The combined teachings of Wang, Wang '971, Adler and Cookson fail to suggest detecting a first digital watermark from a substrate of the printed object, in combination with the other elements of claim 12. Cookson mentions that his method is applicable to music and video. However, Cookson fails to provide even the slightest suggestion of using his method for printed objects, and specifically, using a first watermark from a substrate of the printed object and a second watermark from an image scanned of the printed object to determine authenticity of the printed object as claimed. Wang, Wang '971 and Adler fail to provide these teachings as well. Even when combined (though there is no motivation to combine them), Wang, Wang '971, Adler and Cookson fail to teach all of the elements of claim 12.

While both Wang and Wang '971 refer to retrieving a watermark from a document, they do not refer to detecting a digital watermark from a substrate as claimed. Neither Cookson nor Adler provide this teaching either.

Moreover, there is no motivation to use Cookson or Adler for printed objects.

Claims 14 and 16 are patentable for the same reasons as claim 12.

Claim 13 is patentable over the combination of Wang, Adler, Cookson and Crane

This position remains valid whether or not Wang '971 is considered in combination with these references because Wang' 971 does not teach the elements missing from the previous combination.

Claim 15 is patentable over the combination of Wang, Wang '971, Adler, Cookson and Brundage

This position remains valid whether or not Wang '971 is considered in combination with these references because Wang' 971 does not teach the elements missing from the previous combination.

Claim 17 is patentable over Wang, Adler, Wang '971 and Rhoads

Rhoads does teach use of fiducials in image processing, but the combined teachings do not teach or suggest: "determining authenticity of the printed object by comparing the location of the digital watermark to the visible fiducial" as claimed.

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In view of the above, the claims are patentable over the cited art.


Date: November 28, 2005

Customer Number 23735

Telephone: 503-469-4800
FAX: 503-469-4777

Respectfully submitted,

DIGIMARC CORPORATION

By 
Joel R. Meyer
Registration No. 37,677